

IN THE SPECIFICATION:

The paragraph bridging pages 3 and 4 is amended as follows:

The invention ~~[[(1)]]~~ 1 of the present application may provide a device for applying a foamed hot melt adhesive having a first compression process including a first gear pump and a second compression process including a second gear pump, supplying a hot melt adhesive with application of pressure in the first compression processing, mixing a gas with the a hot melt adhesive in the second compression process, and discharging the foamed hot melt adhesive from a discharge opening, wherein the first gear pump of the first compression process and the second gear pump of the second compression process are driven by drive mechanisms independently from each other and rotation frequencies of the first gear pump and the second gear pump, respectively, are set independently and arbitrarily~~[[.]], and~~

The first full paragraph on page 4 is amended as follows:

~~According to the invention (2) of the present application according to the invention (1),~~ detecting a pressure of a liquid (a hot melt adhesive) being pressure fed in the second compression process, the rotation frequencies of the first gear pump and the second gear pump, respectively, are sequentially controlled so as to automatically control an amount of the gas to be mixed.

The second full paragraph on page 4 is amended as follows:

According to the invention ~~[[(3)]]~~ 2 of the present application ~~according to the invention (1),~~ a gas suction opening is provided between the first gear pump and the second gear pump in the second compression process and a mixer is provided between the gas suction opening and the second gear pump so as to enhance mixture and dispersion between the gas and a liquid, and

The third full paragraph on page 4 is amended as follows:

~~According to the invention (4) of the present application according to the invention (3),~~ an end of a return circuit in the second compression process is located at a downstream of the first gear pump so as to prevent air bubbles from returning to a tank, namely, between the first gear pump and the gas suction opening, so as to prevent air bubbles from returning to a tank.

The fourth full paragraph on page 4 is amended as follows:

According to the invention ~~[[(5)]]~~ 3 of the present application ~~according to the invention (1),~~
a gun installs a valve mechanism and a restriction valve therein so as to produce a single bubble.

The last full paragraph on page 6 is amended as follows:

An end of a return circuit in the second compression process is located at the downstream side of the first gear pump, namely, ~~[between the first gear pump and the gas suction opening]~~
between the first gear pump and the gas suction opening.

The first full paragraph on page 5 is amended as follows:

According to the invention ~~[[(6)]]~~ 4 of the present application, a method for selectively applying a foamed hot melt adhesive and a solid hot melt adhesive using the device for applying a foam hot melt adhesive according to the invention ~~[[(1)]]~~ 1, the ratio of discharge between the first gear pump and the second gear pump is automatically controlled to be set at 1/1 to apply the solid hot melt adhesive, the ratio of discharge between the first gear pump and the second gear pump is automatically controlled to be set at a value greater than 1/1 to apply the foamed hot melt adhesive, and application of the foamed hot melt adhesive and that of the solid hot melt adhesive can be selectively performed by the device for applying the foamed hot melt adhesive.

The paragraph bridging pages 14 and 15 is amended as follows:

~~The first invention of the present application has advantages such that, by setting the rotation frequencies of the first gear pump and the second gear pump, respectively, independently and arbitrarily, upon the foamed (air bubbles are mixed) hot melt application, the amount of mixing of the air bubble is arbitrarily decided by selecting the rotation frequency of the second pump;~~

The first full paragraph on page 15 through the paragraph bridging pages 16 and 17 are all amended as follows:

~~The second invention of the present application according to the first invention has an advantage such that, by detecting the pressure of the liquid (the hot melt adhesive agent) being sent by pressure and sequence controlling the rotation frequencies of the first gear pump and the second~~

gear pump, respectively, to automatically control the amount of mixing of the gas, the sequence control requiring no regulation to mix the optimum amount of the gas that is troublesome and takes a long time is installed and the optimum amount of the air bubbles can be automatically mixed.

The present third invention of the present application according to the first invention has an advantage such that the time to mix the gas can be made shorter by providing the gas suction opening and the mixer at the upstream side of the second gear pump in the second compression process to enhance mixture and dispersion between the gas and the liquid (the hot melt adhesive) and idling time of starting the manufacture can be made shorter.

The forth invention of the present application according to the third invention has an advantage such that the end of the return circuit in the second compression process is located at the downstream side of the first gear pump, the air bubbles are prevented from returning to the tank side and no air bubble returns to the melting system (the tank). As a result, the melting time in the melting system can be faster.

The present fifth invention has an advantage such that approximately even air bubbles can be finely distributed not as a continuous foam Q but as a single foam P since the restriction valve is provided at the gun at the end of the system in addition to the valve mechanism.

According to the sixth invention, it is possible to further select the function as the device for applying the solid hot melt adhesive that applies the liquid not including the air bubble 100% when the ratio of discharge is defined as 1 under the sequence control of the microcomputer PID control, namely, that performs the application of the solid hot mail adhesive in addition to the function as the device for applying the foamed hot melt adhesive such that the device for applying the single foamed hot melt adhesive controls the ratio of discharge to the value greater than 1 to perform the application of the foamed hot melt adhesive, and the present fourth invention has an advantage to enable the two kinds of application formations to be treated by a single system.

The utilization possibility in industry

According to the present invention, in application of the foamed hot melt adhesive, the mixing ratio of foam can be selectively and quickly set, and also application of the foamed hot melt adhesive and that of the solid hot melt adhesive (application of the 100% hot melt adhesive without air bubbles) can be selectively performed, so that the preferable application of the hot melt adhesive corresponding to various kinds of the application base materials can be performed. Therefore, the present invention is effective for enhancing the usage of the hot melt adhesive.

After the end of the paragraph on page 7, the following paragraphs are added:

The first invention of the present application has advantages, for example, by setting the rotation frequencies of the first gear pump and the second gear pump, respectively, independently and arbitrarily, upon the foamed (air bubbles are mixed) hot melt application, the amount of mixing of the air bubble is arbitrarily decided by selecting the rotation frequency of the second pump; further, by detecting the pressure of the liquid (the hot melt adhesive agent) being sent by pressure and sequence-controlling the rotation frequencies of the first gear pump and the second gear pump, respectively, to automatically control the amount of mixing of the gas, the sequence control requiring no regulation to mix the optimum amount of the gas that is troublesome and takes a long time is installed and the optimum amount of the air bubbles can be automatically mixed; and still further, the foam magnifying power can be set rapidly and the set foam magnifying power can be automatically maintained.

The second invention of the present application according to the first invention has an advantage such that the time to mix the gas can be made shorter by providing the gas suction opening and the mixer at the upstream side of the second gear pump in the second compression process to enhance mixture and dispersion between the gas and the liquid (the hot melt adhesive) and idling time of starting the manufacture can be made shorter. Further, when the end of the return circuit in the second compression process is located at the downstream side of the first gear pump, the air bubbles are prevented from returning to the tank side and no air bubble returns to the melting system (the tank). As a result, the amount of application is stable (if the liquid having the air bubbles is sucked by the first pump, the amount of application is unstable) and further, the melting time in the melting system can be faster (if the air bubble return to the tank, the foams are not cleared and the melt liquid in the tank maintains the foams as they are, so that when melting the liquid again, the present second invention has an advantage to prevent consumption of air energy of the foams and the wasting time.

The present third invention has an advantage such that approximately even air bubbles can be finely distributed not as a continuous foam Q but as a single foam P since the restriction valve is provided at the gun at the end of the system in addition to the valve mechanism.

According to the fourth invention, it is possible to further select the function as the device for applying the solid hot melt adhesive that applies the liquid not including the air bubble 100%

when the ratio of discharge is defined as 1 under the sequence control of the microcomputer PID control, namely, that performs the application of the solid hot melt adhesive in addition to the function as the device for applying the foamed hot melt adhesive such that the device for applying the single foamed hot melt adhesive controls the ratio of discharge to the value greater than 1 to perform the application of the foamed hot melt adhesive, and the present fourth invention has an advantage to enable the two kinds of application formations to be treated by a single system.

According to the present invention, in application of the foamed hot melt adhesive, the mixing ratio of foam can be selectively and quickly set, and also application of the foamed hot melt adhesive and that of the solid hot melt adhesive (application of the 100% hot melt adhesive without air bubbles) can be selectively performed, so that the preferable application of the hot melt adhesive corresponding to various kinds of the application base materials can be performed. Therefore, the present invention is effective for enhancing the usage of the hot melt adhesive.